VII. DEVELOPMENT OF ALTERNATIVE DEMAND PLANS -- SCENARIO ANALYSIS

A. Factors in Projecting Demand for Recharge Capacity

Three scenarios were developed to project possible levels of demand for CAP water recharge capacity in the Tucson AMA. Low, medium, and high scenarios were chosen to represent the range of possible future demand for recharge capacity. Projections of these demand levels were made for the target years 2000 and 2007. Calendar year 2007 represents the last year of the AWBA's ten year planning period for its Storage Facilities Inventory. Projections of recharge demand were based on information, including population projections, used to monitor the AWS program. The following components of the demand for recharge capacity were used to develop the scenarios.

1. City of Tucson: Three options were selected to represent a range of strategies for meeting water supply needs and complying with AWS requirements: a) deliver CAP water directly without recharge, b) blend CAP water with groundwater for direct delivery, and c) recharge CAP water to offset groundwater pumping.

2. Other Municipal Providers: Selected options for use of CAP water for both designated providers and subdivisions with certificates of AWS include: a) meeting CAGRD minimum replenishment obligations; and b) phased in use of annual storage and recovery to reduce dependence on the CAGRD and protect groundwater allocations.

3. Long-Term Storage Credits (LTSC): Options were selected for each eligible party regarding whether to accrue additional long-term storage credits during this time period at: a) low, b) medium, or c) high rates.

4. Arizona Water Banking Authority: Scenarios were developed using the current AWBA budget, but increasing the cost of CAP water to the AWBA.

It was assumed that some recharge facilities would be expanded in response to the level of demand. For example, in the low demand scenario, the City of Tucson would deliver treated CAP water directly to customers and would not use a strategy of annual storage and recovery. In the high demand scenario, the City of Tucson would recharge the majority of its CAP allocation, and would have to expand the volume of its recharge facilities. Developed recharge capacity for each of the three scenarios was adjusted to demonstrate how recharge facilities in the Plan could respond flexibly to different demand conditions.

B. Scenario Development and Analysis

The scenarios described below are not anticipated utilization patterns. They are used in this report for illustrative purposes only and are meant to frame the possible low-end and high-end

conditions that may define future recharge demand. See Table 5 for estimated demand and supply volumes for each of the following scenarios.

Scenario 1: Low Recharge Demand

City of Tucson: Tucson Water (TW) directly delivers CAP water to most of its potable customers (95% of potable demand). Customers in the outlying portions of the Tucson Water service area and who are not connected to the contiguous distribution system are served groundwater (5% of potable demand). Tucson Water recharges the remainder of its approximately 139,000 AF CAP allocation.

Low TW Recharge Demand = 139,000 - (Potable Demand * 95%)

Other Municipal: Subdivisions with certificates of AWS and designated providers other than Tucson Water rely on the CAGRD to replenish their pumped groundwater. CAGRD stores the minimum required by contract for all of its members.

Low Other Municipal Recharge Demand = Minimum GRD

Long Term Storage Credits: Tucson Water stores water to earn credits at the rate of 10% of its potable water demand minus incidental recharge. No other providers accrue credits.

Low LTSC Demand = (Potable Demand - Incidental Recharge) $*$ 10%

AWBA: AWBA purchases CAP water and storage capacity in the AMA with a budget of $2.1 M. The average price for AWBA recharge is $70/AF. This price includes the following costs: CAP water, use of any conveyance infrastructure necessary beyond the CAP canal, and the negotiated cost for using the recharge facilities.

Low AWBA Recharge Demand = $2,100,000 ÷ $70/AF

Scenario 2: Medium Recharge Demand

City of Tucson: Tucson Water delivers a blend containing 40% CAP water and 60% groundwater to most its potable water customers (95% of potable demand). Customers in the outlying portions of the service area and who are not connected to the contiguous distribution system are served groundwater only (5% of potable demand). Tucson Water stores enough water

to replace 100% of its groundwater demand minus incidental recharge.

Medium TW Recharge Demand = [(Potable Demand * 95%) ∗ 60%] + [(Potable Demand * 5%) - Incidental Recharge]

Other Municipal: Designated providers other than Tucson Water phase in recharge as Annual Storage and Recovery beginning in 2000 by storing a volume of water equal to 10% of their total potable demand minus incidental recharge and increasing by 5% each year thereafter. They choose to debit their groundwater allocations for the remainder of the groundwater. Subdivisions with certificates of AWS rely exclusively on the CAGRD. CAGRD stores the minimum required by contract for all of its members.

Medium Other Municipal Recharge Demand = [(Total Demand - Incidental Recharge) ∗ X] + Minimum GRD Note: in 2000 X= 10% and in 2007 X=45%

Long Term Storage Credits: Tucson Water earns credits at the rate of 15% of its potable water demand minus incidental recharge. Other designated providers accrue credits at the rate of 10% of their potable water demand minus incidental recharge.

Medium LTSC Demand = [(TW Potable Demand - Incidental Recharge) * 15%] + [(Other Potable Demand - Incidental Recharge) ∗ 10%]

AWBA: AWBA purchases CAP water and storage capacity in the AMA with a budget of $2.1 M. The average price for AWBA recharge is $60/AF. This price includes the following costs: CAP water, use of any conveyance infrastructure necessary beyond the CAP canal, and the negotiated cost for using the recharge facilities.

Medium AWBA Recharge Demand = $2,100,000 ÷ $60/AF

Scenario 3: High Recharge Demand

City of Tucson: Tucson Water directly delivers no CAP water to its potable customers. It stores as ASR enough water to replace 80% of its potable demand minus incidental recharge. It chooses to debit its groundwater allocation for the remaining groundwater.

High TW Recharge Demand = (Potable Demand - Incidental Recharge) * 80%

Other Municipal: Designated providers, other than Tucson Water, store as ASR enough water to replace 75% of their groundwater demand minus incidental recharge. Subdivisions with certificates of AWS rely exclusively on the CAGRD. CAGRD stores the minimum required by contract for all of its members.

High Other Municipal Recharge Demand = [(Potable Demand - Incidental Recharge) $*$ 75%] + Minimum GRD

Long Term Storage Credits: Tucson Water earns credits at the rate of 20% of its potable demand minus incidental recharge. Other designated providers earn credits at the rate of 15% of their potable demand minus incidental recharge.

High LTSC Demand = [(TW Potable Demand - Incidental Recharge) $*$ 20%] + [(Other Municipal - Incidental Recharge) * 15%]

AWBA: AWBA purchases CAP water and storage capacity in the AMA with a budget of $2.1 M. The average price for AWBA recharge is $50/AF. This price includes the following costs: CAP water, use of any conveyance infrastructure necessary beyond the CAP canal, and the negotiated cost for using the recharge facilities.

High AWBA Recharge Demand = $2,100,000 ÷ $50/AF

Table 5. Recharge Demand Scenarios (acre-feet)

Scenario 1: Low Demand	**2000**	**2007**
Tucson Water	35,300	25,000
Other Municipal	1,400	7,800
Long-Term Storage Credits	10,400	11,500
AWBA	30,000	30,000
Total	77,100	74,300
Scenario 2: Medium Demand	**2000**	**2007**
Tucson Water	62,900	69,000
Other Municipal	1,800	10,300
Long-Term Storage Credits	17,000	18,900
AWBA	35,000	35,000
Total	116,700	133,200
Scenario 3: High Demand	**2000**	**2007**
Tucson Water	82,500	90,600
Other Municipal	10,600	15,400
Long-Term Storage Credits	22,900	25,500
AWBA	42,000	42,000
Total	158,000	173,500